

S. simulans Schaeffer. Texas.

Schaeffer, *l. c.*, XIII, 1905, p. 180.

S. huachucae Schaeffer. Arizona.

Schaeffer, *Sci. Bull. Brookl. Inst. Mus.*, I, 1905, p. 176.

S. defecta Schaeffer. Arizona.

Schaeffer, *l. c.*, p. 175.

S. pulchella Mäklin. Mexico, Texas.

Mäklin, *l. c.*, p. 589; Champion, *l. c.*, p. 32, pl. 2, fig. 8; Schaeffer, *Journ. N. Y. Ent. Soc.*, XIII, 1905, p. 180.

There are many Mexican species of *Statira*, which are not included in this list.

A SHORT REVIEW OF THE NORTH AMERICAN SPECIES OF ONTHOPHAGUS (COL. SCARAB.).

BY CHARLES SCHAEFFER,

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The addition of three more species of *Onthophagus* to our fauna besides those species made known since Dr. Horn published his paper¹ on the North American species of this genus make it advisable to give an account of all our species. Dr. Horn enumerated five species in the paper mentioned above with three varieties of *janus*. Two of these varieties, *subaeneus* and *orpheus*, are restored to specific standing as they are in no way connected with each other. The armature of the head and prothorax of the males of certain Scarabæidæ differ very much individually and are greatly reduced in the smaller and feebler males which resemble then more or less the females, but, as a rule, either the reduction or the stronger development of the armature affects the head and prothorax alike in the same species and never is one part more developed or reduced than the other.

The males of those species of which the two sexes do not differ from each other in the form of prothorax are said to be known only by their more slender anterior tibiæ and smoother head. This is true, but the difference, especially in the anterior tibiæ, is not so striking in our species. However, a better character of distinguishing the two sexes, which I do not find mentioned anywhere, is the form of the

¹ Trans. Am. Ent. Soc., Vol. V, p. 137.

last abdominal segment. This segment is at middle broadly arcuately emarginate in the male and is therefore much narrower at middle than at sides, while the female has the last abdominal segment not emarginate at middle and of equal or very nearly equal width throughout.

O. brevifrons Horn, which I do not know, is not included in the following table, but the description is given at the end of the notes and remarks which follow the table.

TABLE OF THE SPECIES OF ONTHOPHAGUS.

1. Thorax and elytra uniformly black, shining 2
 Thorax and elytra either variable in color or when black, never shining 3
2. Large species, 10-13 mm., upper cephalic carina of male prolonged into a moderate long horn or acute tubercle on each side, lower carina absent; clypeus different in the two sexes, broad, sides almost straight, anteriorly reflexed and anterior margin truncate at middle in the male; narrower with sides oblique and anterior margin emarginate in the female *coproides*.
 Smaller species, 6-6.5 mm., upper cephalic carina of male obliterated at middle but on each side visible as a short elevated line; clypeus alike in the two sexes, anterior margin truncate *polyphemi*.
3. Prothorax on disk and at sides distinctly granulate¹ 4
 Prothorax not granulate but punctate, at least on disk² 7
4. Prothorax shining, metallic green; elytra more or less dark metallic green with base and sometimes apex testaceous; the head of the male has the upper carina produced on each side into a slender horn, prothorax produced at middle into a broad process, which is arcuately emarginate at apex *subaneus*.
 Prothorax dull 5
5. Clypeus emarginate at apex, color brownish black, head of male with two, rather closely placed, erect horns, lower carina absent. Prothorax scarcely produced at middle, the granules less numerous and smaller than in *hecate* *velutinus*.
 Clypeus not emarginate at apex, either truncate, rounded or more or less produced at middle 6
6. Uniformly dark or brownish black, elytra in some western specimens at apex and sides with one or more small testaceous spots; second and following intervals with a confused triseriate punctuation; upper cephalic carina in male feeble or absent, lower carina distinct; prothoracic process elongate and feebly emarginate at apex with a more or less distinct bidentate process at middle of emargination... *hecate*.

¹ The granules are very distinct in *subaneus*, *hecate* and *guatemalensis*, but are finer and rather more sparsely placed in *velutinus*.

² In a few species the thorax at apex at sides and middle has some more or less distinct granules, which, however, do not extend to the disk and base where the thorax is plainly punctured.

Uniformly bluish or greenish, second and following intervals more or less distinctly biserially punctate; prothoracic process of male similar to small male *hecate*, upper cephalic carina produced on each side into a more or less distinct, acute tubercle, lower carina distinct.

guatemalensis.

7. Clypeus at apex truncate or rounded 8
Clypeus at apex distinctly emarginate¹..... 11
8. Prothorax and elytra uniformly metallic green or coppery, shining; prothoracic protuberance in male prolonged on each side; fully developed males have on each side of head a short acute elevation, less developed males a short, oblique, elevated line.....*orpheus*.
Prothorax and elytra not uniformly metallic green or coppery..... 9
9. Base of prothorax with a distinctly elevated, narrow margin. Prothorax metallic green or coppery, shining; elytra testaceous with suture and some irregular spots green or blackish green; underside black, with metallic reflection. Male with two feeble tubercle-like elevation on vertex and a short lobe-like prothoracic protuberance....*arizonensis*.
Base of prothorax without distinctly elevated narrow margin..... 10
10. Prothorax shining, with æneous or cupreous tint; elytra uniformly piceous with feeble æneous tint (*janus*); or piceous with base and sometimes apex also more or less testaceous (*substriatus*). Fully developed males with two elongate cephalic horns, prothorax broadly but feebly produced at middle*janus*.
Prothorax and elytra dull, black or brownish black; males without any cephalic or prothoracic protuberance or horns.....*pennsylvanicus*.
11. Prothorax at base margined with a narrow, elevated line..... 12
Prothorax at base without narrow elevated line..... 13
12. Prothorax and elytra cupreous, shining, male without cephalic or prothoracic protuberance*cribricollis*.
Prothorax black or brownish black, convex and declivous in front, elytra testaceous with black spots; head of male with a strongly produced upper carina which at middle is prolonged into a narrow horn-like prominence, lower carina absent*nuchicornis*.
Prothorax and elytra uniformly black or bluish black; head of male without distinct carinæ or horns; prothorax of male produced at middle into a short broad lobe, the lobe at apex rounded, slightly recurved and feebly emarginate at middle*lecontei*.
13. Upper cephalic carina in male and female represented by two more or less distinct tubercles, lower carina feeble or absent; prothorax alike in both sexes; prothorax and elytra brownish black, elytra generally with pale spots*tuberculifrons*.
Male without cephalic carinæ or protuberance, female with the usual upper and lower carinæ; prothorax of male produced at middle into a short, broad, conical lobe, except in *texanus* 14

¹ Feebly emarginate in some specimens of *nuchicornis*.

14. Prothorax and elytra uniformly brownish black, dull*anthracinus*.
 Prothorax æneous or bronze, shining 15
15. Prothorax uniformly æneous or bronze, shining; elytra piceous, with more or less distinct yellow spots, surface with a somewhat greasy appearance; prothorax of male produced anteriorly into a short, conical lobe; anterior tibiæ elongate with a pencil of hairs in the apical emargination*landolti*.
 Prothorax shining, bronze or æneous at middle, at sides more or less yellowish; elytra brown, dull, with yellow spots more or less longitudinally confluent, forming in some specimens longitudinal vittæ; prothorax alike in the male and the female, unmodified; anterior tibiæ of male scarcely more elongate than in the female and without pencil of hairs in the apical emargination*texanus*.

Onthophagus coproides Horn.

Horn, Trans. Kans. Acad. Sci., Vol. VII, p. 79.

?*O. cuboidalis* Bates. Biol. Cent. Am. Col., Vol. 11, pt. 2, p. 79.

Our largest species (10–11 mm.); of uniform black color, polished. The clypeus of the male is broad, the sides nearly straight; anterior margin with more or less rounded sides, subtruncate at middle, lower carina present, but feeble; upper carina arcuate, produced laterally on each side into a short horn. Prothorax suddenly declivous in front, at middle broadly, subtriangularly produced; the punctuation is rather strong in front becoming finer and almost obliterated at base, the base with narrow, elevated margin. The elytral intervals are feebly punctate. The female has a smaller clypeus with oblique sides and emarginate anterior margin; the carinæ are stronger than in the male, the posterior one is somewhat depressed at middle.

The description of the Mexican *O. cuboidalis* agrees with our insect very closely and is possibly the same.

Onthophagus polyphemi Hubbard.

Hubbard, Insect Life, Vol. VI, p. 311.

This species is of the size of *O. orpheus* found in the holes of the gopher (*Gopherus polyphemus*) in Florida and is one of the remarkable discoveries of the lamented H. G. Hubbard. The color is uniform black, shining. The clypeus is arcuate and feebly truncate in front; in the male the lower carina is distinct and the upper carina more or less obsolete at middle or sometimes reduced to a pair of tubercles; the prothorax is convex, rather suddenly declivous in front

but not produced at middle. The female has the two carinae distinct as usual, and a less convex prothorax than the male without declivity in front. The intervals of the elytra are distinctly biserially punctate. The anterior tibiae are alike in both sexes. Less developed males are hardly distinguishable from the females, except by the different form of the last abdominal segment.

***Onthophagus subaeneus* Beauvais.**

Beauv., Ins. Afr. et Am., p. 105, tab. 3, fig. 9.

Horn, Trans. Am. Ent. Soc., V, p. 139.

Blatchley, Col. of Ind., p. 919.

This is a good species and not a variety of *janus*. It is more closely related in form, sculpture and armature of prothorax to *hecate* than to any other of our North American species. The color is metallic green, base and apex of elytra and sometimes the pygidium more or less yellowish. The head has the clypeus with a similar process as *hecate*; in the male the upper carina is weak at middle, but produced on each side into a more or less prominent, acute tubercle, or small horn, the prothorax is granulate, produced at middle nearly as in *hecate*, but the process is generally broader at apex and without any bidentate process within the apical emargination.

The female has the prothorax anteriorly produced into a very short, broad protuberance.

***Onthophagus velutinus* Horn.**

Horn, Trans. Am. Ent. Sci., Vol. V, p. 140.

This is a smaller and slightly more elongate species than *hecate* of uniform black or brownish black color, the prothorax rather sparsely and more finely granulate than in *hecate*, the clypeus emarginate and the posterior carina of the head of the male small and produced into two moderately long slender horns. The female is unknown to me. It occurs in Lower California and Arizona.

***Onthophagus hecate* Panz.**

Panz., Faun. Bor. Am. Prodr., 1794, p. 5.

Horn, Trans. Am. Ent. Soc., Vol. V, p. 138.

Blatchley, Col. of Ind., p. 918.

A common, well-known eastern species which is found as far south as Florida and extends west to Texas and Kansas.

The color is uniformly dull black or brownish black, the elytra in some specimens from Kansas and Texas have a very few pale spots at sides and apex; the prothorax is granulated and the intervals of the elytra finely so.

The apex of the clypeus is prolonged into a more or less prominent subtriangular process; the male has the upper carina very faint or absent, the lower present; prothorax produced at middle into a rather broad, elongate process which is anteriorly emarginate with a small bidentate process at middle of emargination. The prothorax of the female is anteriorly less convex than in the male and has a short, broad protuberance which is truncate in front.

***Onthophagus guatemalensis* Bates.**

Biol. Cent. Am. Col., Vol. II, pl. 2, p. 73, tab. V, figs. 16 and 16a.

Though described and known only from such remote localities as British Honduras and Guatemala specimens in my collection from New Braunfels, Texas agree so closely with the description that I am compelled to refer these to *O. guatemalensis*. This species is very much like *O. hecate* in form and sculpture of prothorax and elytra, but the color is always distinctly bluish green, and in the more developed males the upper cephalic carina is on each side acutely produced; the prothorax is not as closely granulate as in *hecate*, the median lobe, in fully developed males, is strongly produced and furcate, nearly as in *orpheus*, in less developed males the prothoracic and cephalic prominences are nearly as in *hecate*; the intervals of the elytra are biserially punctate or rather granulate. In the female the prothorax and head are as in *hecate* except that the upper cephalic carina in *guatemalensis* is sinuate, in *hecate* straight.

***Onthophagus orpheus* Panz.**

Panz., Faun. Bor. Am. Prodr., p. 5, tab. 1, fig. 2.

Horn, Trans. Am. Ent. Soc., Vol. V, p. 139.

Blatchley, Col. of Ind., p. 919.

This is not a variety of *janus* but a distinct species as there is no connecting link between the two, the cephalic and prothoracic processes of the males are entirely different and never approach each other, and the color is always metallic green or bronze, shining.

The head of the male has the anterior carina feeble at middle, on each side elevated into an acute tubercle; the prothoracic process is

elongate, broad and very deeply, arcuately emarginate at middle. The larger females have a short, broad and anteriorly truncate protuberance at middle of prothorax in front.

In the neighborhood of New York this species is taken occasionally at the Palisades and commonly at West Point by Col. Robinson. Specimens from Wisconsin and Montana in my collection indicate a wide distribution.

***Onthophagus arizonensis* Schaeffer.**

Schaeff., Sci. Bull. Brookl. Inst. Mus., Vol. I, p. 382.

This species was collected by F. W. Nunnenmacher in Nogales, Arizona.

Metallic green with more or less cupreous tint on head and prothorax, elytra pale with suture and a number of variable spots metallic green, the spots more or less longitudinally and transversely confluent. The clypeus is truncate at apex. The head of the male has the upper carina represented by two feeble tubercles, the lower carina is absent. The prothorax of the male is produced at middle into a short cone-like projection.

***Onthophagus janus* Panz.**

Panz., Faun. Bor. Am. Prodr., 1794, p. 5, tab. 1, fig. 3.

Horn, Trans. Am. Ent. Soc., Vol. V, p. 139.

Blatchley, Col. of Ind., p. 919.

***Onthophagus striatulus* Beauv.**

Beauv., Ins. Afr. et Am., p. 92, tab. 3, fig. 5.

Horn, Trans. Am. Ent. Soc., Vol. V, p. 139.

Blatchley, Col. of Ind., p. 919.

This well-known species is widely distributed in the Eastern United States.

Head and prothorax metallic green or bronze, shining; elytra less shining than the prothorax, uniformly piceous with more or less cupreous reflection (*janus*) or piceous with base and apex more or less pale (*striatulus*). Head of male with clypeus anteriorly rounded, lower carina absent, upper carina feeble and on each side produced into an acute tubercle or slender horn. Prothorax produced at middle into a very short, broad projection.

Both forms *janus* and *striatulus* occur together and are connected by intermediate forms.

Onthophagus pennsylvanicus Harold.

Harold, Coleopterologische Hefte, Vol. VIII, p. 115.

Horn, Trans. Am. Ent. Soc., Vol. V, p. 141.

Blatchley, Col. of Ind., p. 920.

Our most common and well known eastern species which is found as far south as Florida and from there extends to Texas and Kansas. The color is generally brownish black, with a faint metallic tint on the prothorax. The prothorax is alike in both sexes, not modified in the male. The clypeus is arcuate-truncate in front. The male has the head without carinæ, in some specimens, however, the upper carina is faintly indicated. In the female the upper carina is generally very faintly indicated and the lower distinct; in very small females both carinæ are often obsolete or even absent. The front tibiæ are slightly more elongate in the male than in the female.

Onthophagus cribricollis Horn.

Horn, Trans. Kans. Acad., Vol. VII, p. 76

Blatchley, Col. of Ind., p. 920.

This species is described from Kansas and Texas and is reported from Indiana but seems to be very rare in collections. I was unable to secure any specimens from the typical localities but two female specimens in my possession, one from Lakehurst, N. J. and one from Long Island (Yaphank), N. Y., agree in every respect with the description of this species. They look at first sight like very small *O. orpheus* but the elytra are a little less shining, the prothorax is relatively more coarsely punctate and is distinctly margined at base and the clypeus is rather deeply, triangularly emarginate; the color is dark bronze. The head of the male is described as unarmed and the prothorax not modified.

This species is perhaps not as rare as it seems and may be overlooked on account of its great resemblance to very small *O. orpheus*.

Onthophagus nuchicornis Linn.

Linn., Syst. Nat., I, 2, p. 547.

Melsh., Proc. Acad. Nat. Sci. Phil., Vol. II, p. 134 (*O. rhinoceros*).

An introduced European species, which is frequently taken in New Jersey and New York (Long Island).

It is one of the larger species and is black or brownish black, dull, elytra pale, sprinkled with a variable number of darker spots. The

clypeus is rather feebly emarginate, the posterior carina of the head of the male is produced into a short, broad plate, from the middle of which arises a narrow horn, the lower carina is absent; the prothorax is rather convex and declivous in front without projections. The female has the head with the usual two carinae and the prothorax is less convex than in the male and in fully developed specimens there is at middle a short, broad projection.

***Onthophagus lecontei* Harold.**

Harold, Col. Heft., Vol. III, p. 115.

Bates, Biol. Cent. Am. Col. Vol. II, pt. 2, p. 73.

I have a few specimens from Prescott, Ariz., received from Mr. George Franck, which are referable to this Mexican species. The color is black, opaque, surface sparsely clothed with short, stout, fuscous hairs; clypeus at apex reflexed and rather deeply emarginate at middle. Prothorax strongly but not densely punctate, subasperate near apex. The elytra have the striae feebly impressed and punctate, the intervals with two more or less regular rows of punctures. The males have the upper carina of the head feeble the lower is absent. The prothorax in the male is lobed at middle, the lobe short and broad, rotundate-truncate and slightly reflexed at apex and emarginate at middle. The anterior tibiae of the male are elongate and slightly curved at apex. Length 4.5-5 mm.

***Onthophagus tuberculifrons* Harold.**

Harold, Coleopterologische Hefte, Vol. VIII, p. 115.

Horn, Trans. Am. Ent. Soc., Vol. V, p. 140.

Blatchley, Col. of Ind., p. 919.

This species occurs in the pine region of Long Island and New Jersey and extends as far south as Florida.

Dull brownish-black, elytra with a variable number of pale spots, which are rarely absent. The clypeus is emarginate at apex; the head has the vertex bituberculate in both sexes, the lower carina is more feeble in the male than in the female; the prothorax is unmodified and alike in male and female.

***Onthophagus anthracinus* Harold.**

Harold, Coleopterologische Hefte, Vol. XI, p. 104.

Bates, Biol. Cent. Am. Col., Vol. II, pt. 2, p. 77.

Schaeffer, Sci. Bull. Brookl. Inst. Mus., Vol. I, p. 15.

I have taken this Mexican species in Brownsville, Texas and

Huachuca, Mts., Arizona, and have specimens from Nogales, Arizona, collected by F. W. Nuppenmacher. It is a little larger than *tuberculifrons*, of dull, uniform, brownish color with very feeble bronze lustre. The clypeus is more or less reflexed at apex and anteriorly emarginate. The head of the male has no carinae nor horns or tubercles. The prothorax of the male is produced at middle into a short cone-like projection which is indicated more or less in the prothorax of the female. The anterior tibiae of the male are much elongated and have at apex within the emargination a pencil of stiff, long hairs.

***Onthophagus landolti* Harold.**

Harold, Stett. Ent. Zeitung, 1880, p. 34.

Bates, Biol. Cent. Am. Col., Vol. II, pt. 2, p. 75, tab. V, figs. 21 and 21a.

Schaeffer, Sci. Bull. Brookl. Inst. Mus., Vol. I, p. 158.

Originally described from Colombia and Venezuela this species extends its range as far north as Texas (Brownsville).

Head, prothorax, metasternum and legs metallic green, shining, except the head, which is dull; elytra and abdomen with very faint bluish or rarely greenish tint, the former generally with a variable number of small, reddish-yellow spots from base to apex, rarely without spots. The head in the male is very sparsely punctate, the lower carina is absent and the upper carina is represented on each side by a small, rather feeble, arcuate ridge. The prothorax is rather coarsely, but sparsely punctate, slightly declivous in front and at middle produced into a very short lobe. The elytra are alutaceous with a somewhat greasy appearance, and the intervals are feebly and finely punctate. The anterior tibiae of the male are greatly elongated and have within the apical emargination a pencil of stiff hairs, the anterior tibiae are normal in the female and the head has the usual two carinae. It is smaller than *O. janus*.

***Onthophagus texanus* new species.**

A few specimens which I have taken in Brownsville, Texas, together with *O. landolti* differ from that species in having the prothorax more or less yellowish at sides, the elytra dull, brown, with the yellow spots forming more or less distinct longitudinal vittae; prothorax of the male without anterior modification, the anterior tibiae scarcely differ from those of the female and are without the pencil of hairs at the apical emargination.

Judging from Bates' remarks in the *Biologia* *O. landolti* is a variable species in Mexico and Central America and it is possible that the above described form is only a color variation of *landolti*. However, my material shows no intermediate forms and the specimens are either referable to *landolti* or *texanus*.

***Onthophagus brevifrons* Horn.**

Horn, Trans. Kans. Acad. Sci., Vol. VII, p. 76.

"Oval, slightly oblong, robust, convex. Head and thorax more shining, varying in color from bluish to violet or greenish metallic. Clypeus short and broad, very obtuse in front, the margin broadly reflexed, surface coarsely not densely punctured, suture indistinct. Front more densely and finely punctured. Vertex with a feebly elevated, transverse, sinuous ridge. Thorax very little wider than the elytra, anteriorly retuse, and concave at the sides, surface coarsely but sparsely punctured, with finer punctures intermixed, more densely punctured at the middle of the protuberance. Elytra broader than long, finely seven striate, the striæ obsoletely, distantly punctulate, the outer striæ arcuate, intervals flat, irregularly biseriately punctulate, each puncture with a short, erect hair; surface opaque, finely granulate, and with slight purple lustre. Body beneath sparsely punctate, abdomen with few finer punctures at the sides. Anterior tibiæ quadridentate, the upper tooth smaller. Length, .40 inch; 10 mm. Kansas, Texas."

"This species resembles *janus*, but is larger, more elongate, thorax more retuse in front and with a differently formed clypeus and cephalic ornamentation."

NEW SPECIES OF PSAMMOCHARIDÆ.

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The new species here described belong mostly to two of the larger genera of the family, genera in which there are still numerous novelties yet to be collected in our country, particularly in the western parts.